PROSIGNAL EX™
SMART WIRING SYSTEM

Owners / Install Manual

Pro Signal Extended Set

General

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Photo: Stacey David's Rat Roaster

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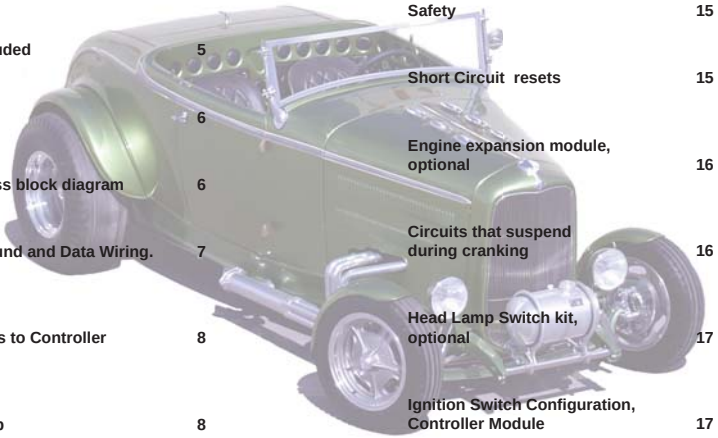


Made in U.S.A.

System:

The Pro-Signal©EX system has 12 input circuits and 15 or more outputs when the optional Engine Module is used. Pro-Signal©EX components may be used alongside legacy fuse systems to meet any vehicle wiring requirements.

Input Module Module:

The Pro-Signal©EX Input Module attaches to the steering column and driver controls. The Input Module also connects to the dashboard indicators and can drive either incandescent bulbs or LEDs. The Input Module senses the switch changes, actuates dashboard indicators, and then sends a data-packet containing the switch states across the system's two-wire data bus to the appropriate Output Module.

Output Modules:

The Pro-Signal©EX Output Module distributes power to accessories and indicators from locally mounted output modules. Each module can handle up to 4 circuits. The 100% solid-state electronic modules provides switching for each circuit according to commands from the Input Module, while continuously monitoring each circuit for short-circuits.

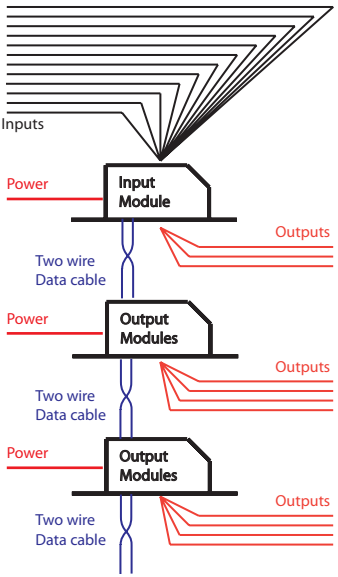
Value added functions:

The Pro Signal©EX has SCT (Self Canceling Turn) signals that are reset when the turn sign switch position changes. Fog lights will turn off when high beams are on (Some states require this).
Status LED has been updated to include which output channels have short circuits.

While we can't anticipate all configurations, the Pro Signal© EX does cover most signaling configurations.

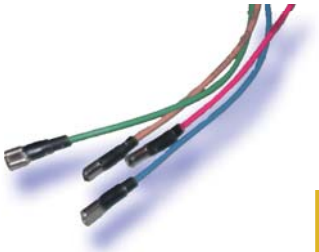
Pro-Signal© EX technology may be used in any vehicle, or any system that uses 12V power and has a need for signaling lights. This includes auto, off road, agricultural equipment and recreational vehicles. It replaces traditional multi-wire harnesses, relays, fuses, and flasher cans with solid-state, micro controller modules.

Pro-Signal© EX replaces traditional fuses by sensing the current through an accessory and automatically shutting down the circuit in the case of a short circuit. Once the short has been removed the module can manually reset. Some circuits automatically reset.



What's Included

V2&V3 modules have a set of faston connector cables included with each module: 4'-10', color coded and printed with functions.

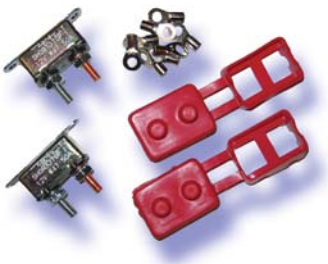


Sealed Input cable with connector and 4'-8' wires. Colors match output functions. Example: HORN input wire is PINK - so is the output wire.

Data harness with module connectors, assembled. Ground wire included. 6', 9', and 15' spans included; other lengths available on line.

Data plugs, One 2pin and One 3pin. Use on open module pig tail data connectors.

Power cables, four; assembled. Two 9', one 12' and one15'



Two 50amp circuit breakers to protect power cables to modules. Boots and lugs included. Switch inputs and module outputs do not require protection.

Modules, one Input Module; one Rear, one Front and one Head Lamp Module are included. Engine Module is optional. V2 Rear Module shown, graphics series, Graphite.

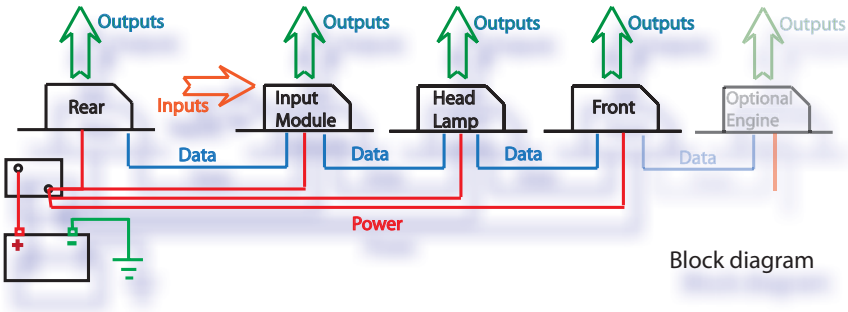
Mounting

The modules are moisture and vibration resistant and mount in any convenient location away from extreme heat sources, such as engine headers. The bolt pattern is 2.45x1.50”, #6 Hardware is recommended. Hex cap screws are preferred. Hardware not included

The Input Module is normally mounted under the dash. Output modules are mounted near there accessory.

Install

Wire Harness block diagram



Block diagram

Note: Connect supplied power and data cables to modules and secure wires appropriately to avoid wire chafing.

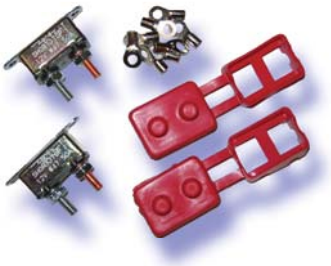
Power, Ground and Data Wiring.

Note: Connect all ground wires to chassis prior to connecting power and data to modules. Ground wires are black and assembled with the data cable.

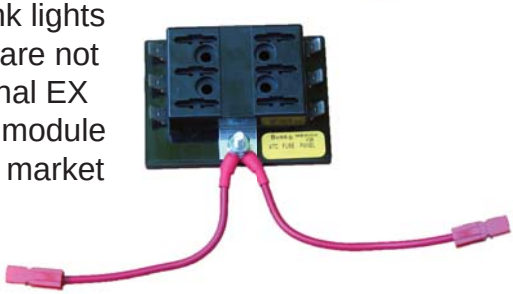
Ensure all grounds are clean and secure. Remove paint and oils.

Data plugs are supplied and are necessary to seal unused module data connectors from moisture. The 3 pin also provides ground for end module.

Note: Always use a circuit breaker or fuse to protect main power cables to modules. Pro Signal EX recommends a 40-50 amp circuit breaker, included.
Connect no more than three modules to a breaker.



Tip: Accessories like trunk lights and audio amplifiers that are not supported by the Pro Signal EX may be connected to the module power cable with an after market fuse block.
See Smart-Wiring.com.



Turn Signal Connections to Controller

Common toggle and momentary switches or a GM style column can be used.

Common GM column configuration - some columns may differ.

Controller inputs	to	GM column connector
Horn (PNK)	Connected to	“G” pin
L Turn (GRN)	Connected to	“H” pin
R Turn (LT BLU)	Connected to	“J” pin

From ignition switch battery pole

Orange 14awg Connect to “N and M” (16AWG)

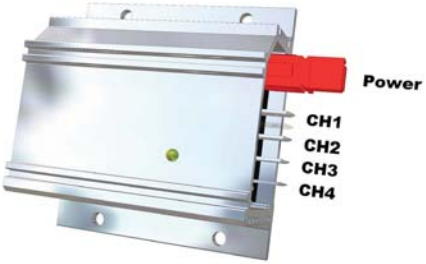
See wiring schematic for details

The flasher wire on the GM column does not need to be connected when using a GM style column. Flash is activated through turn signal wires.

Service loop

The data cables are supplied and pre-assembled. Modification should be made only by an electronic technician. If the cable is too long a “service loop” is recommended. Pre-fabricated data cables and kits can be ordered at Smart-Wiring.com.

Head lamp module



Inputs: None

Outputs: 4

CH1 FOG / DRL

Controlled by Yellow input module wire, pull Low to activate.
Condition 1, ACC must be High.
Condition 2, FOG / DRL will suspend (Turn off) when High Beam is activated.

CH2 Low Beam

Controlled by White input module wire, pull Hi to activate.

CH3 High Beam

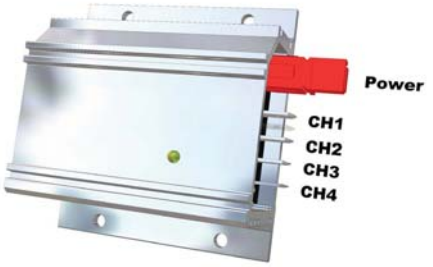
Controlled by White W/Blue stripe input module wire, pull Low to activate.

CH4 ACC

Controlled by Brown input module wire, pull Hi to activate. Use for low current (9.75amps or less) accessories like power radio antenna.

Tip: Pull Hi = 12V, Pull Low = Chassis Ground

Front module



Inputs: None

Outputs: 4

CH1 HORN
Controlled by Pink input wire, pull Low to activate.

CH2 PARK LIGHTS
Controlled by Tan input wire, pull Hi to activate.

CH3 LEFT TURN
Controlled by Green input wire, pull Hi to activate.

CH4 RIGHT TURN
Controlled by Blue input wire, pull Hi to activate.

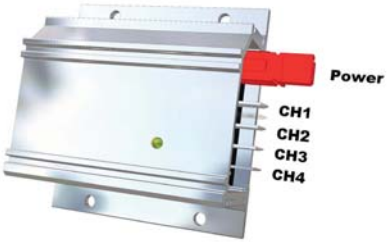
Note: Flashers are activated by pulling both LEFT and RIGHT TURN wires Hi simultaneously.
Front and Rear modules will alternate turn and flasher blinks to reduce load on electrical system.

SCT, Self Canceling Turn signals

Pro Signal EX is equipped with Self Canceling Turn signals that suspend after 90 seconds.
Reset is activated when the turn signal switch position is changed.

Tip: Wire names are underlined in this document.

Rear module



Inputs: None

Outputs: 4

CH1 BACKUP
Controlled by Gray input wire, pull Low to activate.

CH2 PARKING LIGHTS
Controlled by Tan input wire, pull Hi to activate.

CH3 LEFT TURN / Brake
Turn is controlled by Green input wire, pull Hi to activate.
Brake is controlled by Violet input wire, pull Low to activate.

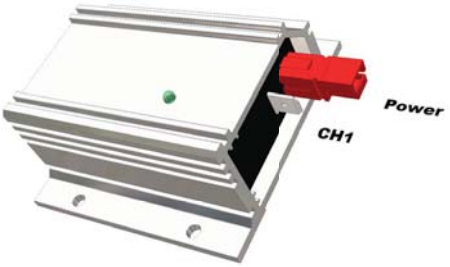
CH4 RIGHT TURN / Brake
Turn is controlled by Blue input wire, pull Hi to activate.
Brake is controlled by Violet input wire, pull Low to activate.

Note: Flashers are activated by pulling both LEFT and RIGHT TURN wires Hi simultaneously.
Front and Rear modules will alternate turn and flasher blinks to reduce loan on electrical system.

Tail Lamp Configuration

A 2 filament bulb and socket will combine brake, turn and flasher into one filament. The park light will use the second filament.

Input module



Inputs: 12

Brown wire, ACC
Pull Hi to activate. Connect to (ACC pole) of Ignition switch.

Pink wire, Horn
Pull Low to activate. Connect to (Horn switch).

Green wire, LEFT TURN
Pull Hi to activate. Connect to (Indicator switch).
Activate flasher by pulling both left and right Hi simultaneously.
Note: Turn signal will not operate unless key is in ACC or Ignition position. Flashers will operate without key. Power for Indicator switch is connected to the ignition switch battery pole. See wiring diagram.

Blue wire, RIGHT TURN
Pull Hi to activate. Connect to (Indicator switch).
Activate flasher buy pulling both left and right Hi simultaneously.
Note: Turn signal will not operate unless key is in ACC or Ignition position, flashers will operate without key. Power for Indicator switch is connected to the ignition switch battery pole. See wiring diagram.

Violet wire, BRAKE
Pull Low to activate. Connect to (Brake switch).

Tan wire, PARK LIGHTS
Pull HI to activate. Connect to (Head light switch).
See Head Lamp switch kit for detailed instructions.
Note: Power for park lights switch can be connected to the ignition switch BATT pole. See wiring diagram.

Gray wire, BACK UP LIGHTS
Pull Low to activate. Connect to (Reverse switch).

Orange wire, IGNITION
Pull Hi to activate. Connect to (Ignition pole) of Ignition switch.

Red wire, START
Pull Hi to activate. Connect to (Start pole) of Ignition switch.

White wire, LOW BEAM
Pull HI to activate. Connect to (Head light switch).
See Head Lamp switch kit for detailed instructions.

White W/Blue Stripe wire, HI BEAM
Pull HI to activate. Connect to (High beam switch).
See Head Lamp switch kit for detailed instructions.

Yellow wire, FOG / DRL
Pull Low to activate. Connect to (Fog lamp switch).
Ground Yellow wire for DRL.
Note: FOG / DRL will deactivate when High Beams are on.

Outputs: 3

CH1 IGNITION SWITCH BATTERY
Always on. This channel has automatic short circuit detect and restart. Circuit will attempt to restart every 10 seconds after a short circuit is detected. Connect to (Battery pole) of ignition switch.
See Ignition switch kit for detailed instructions.

Pin 1 RIGHT TURN Dash Indicator
Controlled by Blue input wire, pull Hi to activate.
LED or incandescent bulb may be used.

Pin 2 LEFT TURN Dash Indicator
Controlled by Green input wire, pull Hi to activate.
LED or incandescent bulb may be used.

Note: Flashers are activated by pulling both LEFT and RIGHT TURN input wires Hi simultaneously.

Tip: Pull Hi = 12V, Pull Low = Chassis Ground

Basic Electrical Specifications:

System specifications:
Model: EX4CH4MV2/3
12V electrical systems only

Module	Inputs	Outputs	Output Power
Input	12	3	75-200W
Front	0	4	150W ea ch
Rear	0	4	150W ea ch
Head Lamp	0	4	200+W ea ch
Optional Engine	0	3	200-400W ea ch

Min-Max Limits

Inputs	Ground to 15V
Output current limits	5 to 30Amps (Factory set)
Thermal operating	-35c to +85c

Fault Status LED

Green,	Once every 10 seconds: healthy, communication okay
Orange,	Once every 10 seconds: module okay; no communication - check data cable.
Red,	See user manual for detailed description, page 18, Fault Status LEDs
No LED,	Missing power or ground

Note: All Smart-Wiring products are for 12V chassis ground vehicles only.

Tip: Most input wires are activated by applying +12V, with five exceptions:

1. Horn
2. Brake
3. Back-up
4. High Beam
5. FOG / DRL

These inputs are pulled Low to activate (ground)

Software

There is nothing for the installer to program. The Pro Signal EX was designed to be easier to install than a legacy system. Programming isn't needed with a legacy system, and programming isn't needed with the Pro Signal system.

Safety

Common Safety Functions

1. A hard short circuit shutdown is initiated by the controller after 2 seconds and is reset by removing the short, turning off the accessory, and then turning it back on.
2. Module outputs are shut down within 2 seconds if data cable is disconnected.

Short Circuit resets

1. Ignition Battery circuit (Input Module CH1) will automatically reset after a short circuit is removed.
2. All other circuits are reset by turning off/on the corresponding input switch.

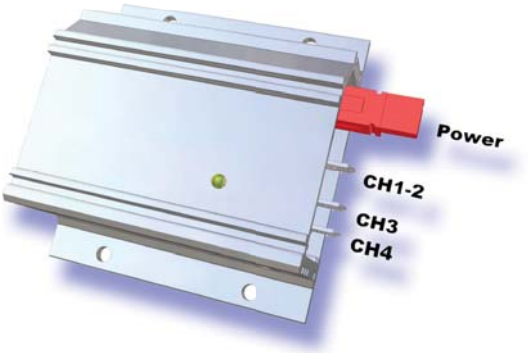
   Example: Parking lights have shorted. Remove short circuit, turn park lights off, then back on.

Engine expansion module, optional

At the time of this printing Smart Wiring is offering two optional Engine Modules.

1) For Coil and Points Ignition systems
2) For Powering an Electronic Ignition

It is our goal to provide more engine module configurations so please visit Smart-Wiring.com new designs.



Circuits that suspend during cranking

During engine cranking the following circuits will suspend to provide more battery current for starting.

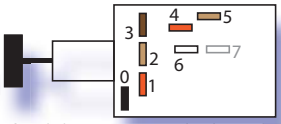
- Low and high beam head lamps, turn signals and parking lights will suspend.

The following safety lights will continue to operate.

- Flashers and brake lights will continue to operate during cranking.

Head Lamp Switch kit, optional

GM style head lamp switches with dimmers, as well as standard switches are supported by the Pro Signal.
Go to Smart-Wiring.com.

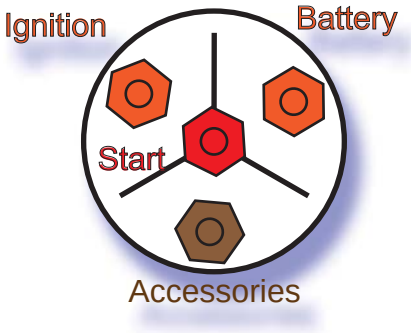


Pin0 Black 16awg, connect to chassis ground
Pin1 Jumper to ***Pin4***, Orange 16awg wire
Pin2 Tan 16awg wire, connect to Dash Lights
Pin3 Brown wire, connect to BATT pole of Ignition switch
Pin5 Tan 20awg wire, to Input Module connector
Pin6 White 20awg wire, to Input Module connector
Pin7 Not used

GM Style, bottom view

Head Lamp switch kit comes partially assembled.

Ignition Switch Kit, optional



See ignition switch kit for more details.
Go to Smart-Wiring.com.

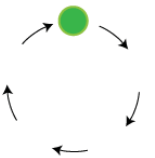
Note: Do not exceed the maximum current rating of the switch

Trouble shooting

Problem:	Turn signals do not operate
Cause:	Ignition switch is off or brown ACC input wire is disconnected from ignition switch
Solution:	Turn ignition switch to ACC or IGNITION. Or connect brown wire to ignition switch.

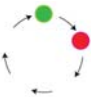
Fault Status LEDs

Each module has a status LED to provide system and module diagnosis: LED cycles every 10 seconds.

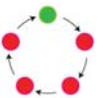


One green blink indicates system and module are okay

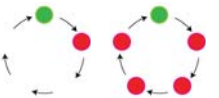
One green blink and one red blink:
Data communication okay. (Short circuit on channel 1)



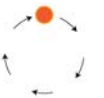
One green blink and four red blinks:
Data communication okay. (Short circuit on channel 4)



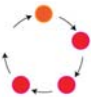
One green blink and one red blink:
Data communication okay. (Short circuit on Channel 1). Then the next cycle one green blink and four red blinks: Data communication okay. Short circuit on Channel 4. (Shorts on both channels 1&4)



One orange blink:
(Loss of data communication) check data cable.



One orange blink and three red blinks:
(Loss of data communication) check data cable.
(Short circuit on Channel 3)



No LED: No power or missing ground.

Note: 2-3 cycles (20-30 seconds) will be needed for the LED to update status.

Glossary of Terms

ACC:
Accessory

AWG:
American Wire Gauge.

BLK:
Black

BRN:
Brown

Channel:
An electrical circuit

Control lines:
Two twisted wires from the Input Module to all output modules. These wires carry the data to turn on and off all accessories attached to the output modules.

Camo:
Camouflage

Conn:
Connector

Current:
A measure of electron flow (AMP)
$^{E}/_{R} = I$

Data:
Digitally formatted information

FAQ:
Frequently asked questions

Filament:
Illuminating wire in bulb

GM:
General Motors

GND:
Ground, Chassis Ground, Low

GRN:
Green

GRY:
Gray

HI:
12V or Power, PWR

IND:
Indicator

IGN:
Ignition

Legacy system:
Old style wire harness

LED:
Light emitting diode

LT BLU:
Light Blue

Low:
Ground, Chassis Ground, GND

Matrix:
Software mapping grid of system functions.

Min-Max:
Minimum to Maximum

MOM:
Momentary

NC:
Not Connected or Normally closed

NO:
Normally Open

ORG:
Orange

OEM:
Original Equipment Manufacture

Pig tail:
Wires from module with connectors.

PNK:
Pink

PWR:
12V or Power, HI

Pole:
Electrical connection point

SCT:
Self Cancelling Turn signal

Software:
Not hardware

SW:
Switch

VIO:
Violet

V2 & V3:
Module hardware version

Yel:
Yellow

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